

WHAT IS CLAIMED IS:

1. An optical disc recording apparatus comprising:

recording pulse generating means for setting a recording power at approximately the leading end portion of a recording pulse in steps of a plurality of stages and for generating a recording pulse of a pulse width corresponding to a length of a pit to be formed; and

laser means for illuminating the laser light by the recording pulse supplied to form a recording data string comprised of pits and lands defined between said lands on a recording medium; wherein

the laser light emitting pulsed light by the recording pulse generated by said recording pulse generating means is illuminated on a write-once optical disc as said recording medium to effect recording.

2. The optical disc recording apparatus according to claim 1 wherein

said recording pulse generating means generates at least a first pulse corresponding to recording data, a second pulse for synthesis to a leading end of said first pulse and a third pulse for synthesis to a leading end of said first pulse, said third pulse being of a pulse width smaller than said second pulse, said first to third pulses being synthesized to generate said recording pulse.

3. The optical disc recording apparatus according to claim 2 wherein

said recording pulse generating means varies the pulse width and/or the pulse level of one or more of said first to third pulses, depending on recording conditions, to

generate said recording pulse.

4. The optical disc recording apparatus according to claim 2 wherein

    said recording pulse generating means includes pit/land length detection means for detecting the length of the pit/land to be formed and varies the pulse width and/or the pulse level of one or more of said first to third pulses, depending on the combinations of the lengths of the pits/lands to be formed, based on a detection output by said pit/land length detection means, to generate a recording pulse.

5. The optical disc recording apparatus according to claim 2 wherein

    said recording pulse generating means varies the pulse width and/or the pulse level of one or more of said first to third pulses, depending on conditions of an optical disc for recording, to generate the recording pulse of a pulse width.

6. The optical disc recording apparatus according to claim 4 wherein

    said recording pulse generating means variably sets the pulse width of one or more of said first to third pulses responsive to at least one of the length of the pit formed directly previously and the length of the land formed directly previously.

7. The optical disc recording apparatus according to claim 4 wherein

    said recording pulse generating means varies the pulse width of said first pulse depending on the length of a land formed directly ahead of a pit formed.

8. The optical disc recording apparatus according to claim 7 wherein

    said recording pulse generating means varies the pulse width of said first pulse depending on the length of a pit formed.

9. The optical disc recording apparatus according to claim 7 wherein  
said recording pulse generating means varies the pulse width of said first pulse  
depending on the length of a land formed directly at back of a pit formed.

10. The optical disc recording apparatus according to claim 1 further comprising:  
changeover means for switching the operation of said drive pulse generating  
means to preclude outputting of at least one of said first to third pulses generated by  
said recording pulse generating means, said recording pulse generating means  
performing switching control of said changeover means in association with a speed of  
forming a recording data string on said recording medium.

11. The optical disc recording apparatus according to claim 10 wherein  
said recording pulse generating means controls said changeover means so that,  
if said optical disc is rotated at a linear speed not higher than a speed four times a  
reference speed, said third pulse is not output.

12. A recording method for an optical disc comprising:  
generating a recording pulse having a pulse width corresponding to a length of  
a pit formed, said recording pulse being so formed that a recording power at  
approximately the forward end thereof is stepped over plural stages; and  
illuminating a laser light beam, excited in pulsed light by said recording pulse,  
on a write-once optical disc to effect recording.

13. The recording method for an optical disc according to claim 12 wherein at least  
a first pulse corresponding to recording data, a second pulse for synthesis to a leading

end of said first pulse and a third pulse for synthesis to a leading end of said first pulse, said third pulse being of a pulse width smaller than said second pulse, are generated, said first to third pulses being synthesized to generate said recording pulse.

14. The recording method for an optical disc according to claim 13 wherein recording is performed as the pulse width and/or the pulse level of one or more of said first to third pulses is controlled depending on a recording condition.

15. The recording method for an optical disc according to claim 13 wherein recording is performed as the pulse width and/or the pulse level of one or more of said first to third pulses is controlled depending on different combinations of the lengths of the pits/lands formed.

16. The recording method for an optical disc according to claim 13 wherein recording is performed as the pulse width and/or the pulse level of one or more of said first to third pulses is varied depending on the condition of the optical disc to effect recording.